1. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{12x^3 + 39x^2 - 30}{x + 3}$$

A. $a \in [-38, -33], b \in [147, 149], c \in [-441, -436],$ and $r \in [1291, 1296]$.

B. $a \in [11, 13], b \in [75, 77], c \in [220, 232],$ and $r \in [644, 646]$.

C. $a \in [11, 13], b \in [-3, 5], c \in [-12, -2],$ and $r \in [-7, 2]$.

D. $a \in [-38, -33], b \in [-70, -65], c \in [-207, -199],$ and $r \in [-654, -650]$.

E. $a \in [11, 13], b \in [-14, -8], c \in [29, 38],$ and $r \in [-181, -171]$.

---

2. Factor the polynomial below completely. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 15x^3 - 44x^2 - 79x + 60$$

A. $z_1 \in [-5, -2],\ z_2 \in [-0.9, -0.2],$ and $z_3 \in [0.92, 1.85]$

B. $z_1 \in [-5, -2],\ z_2 \in [-2.2, -0.9],$ and $z_3 \in [0.42, 0.84]$

C. $z_1 \in [-0.6, 0.4],\ z_2 \in [1.1, 2.8],$ and $z_3 \in [3.7, 4.42]$

D. $z_1 \in [-1.67, -0.67],\ z_2 \in [-0.3, 0.8],$ and $z_3 \in [3.7, 4.42]$

E. $z_1 \in [-5, -2],\ z_2 \in [-3.3, -2.1],$ and $z_3 \in [-0.02, 0.34]$

---

3. Factor the polynomial below completely. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 10x^3 + 3x^2 - 79x - 60$$

A. $z_1 \in [-3.1, -2.7],\ z_2 \in [0, 0.71],$ and $z_3 \in [4.9, 5.12]$

B. $z_1 \in [-3.1, -2.7],\ z_2 \in [0, 0.71],$ and $z_3 \in [1.12, 1.66]$

C. $z_1 \in [-2.8, -1.6],\ z_2 \in [-0.89, -0.5],$ and $z_3 \in [2.53, 3.23]$

D. $z_1 \in [-3.1, -2.7]$, $z_2 \in [0.74, 1.16]$, and $z_3 \in [2.35, 2.78]$

E. $z_1 \in [-1.5, -0.9]$, $z_2 \in [-0.58, -0.22]$, and $z_3 \in [2.53, 3.23]$

---

4. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{4x^3 - 75x - 129}{x - 5}$$

A. $a \in [2, 7], b \in [12, 18], c \in [-14, -6]$, and $r \in [-181, -171]$.

B. $a \in [2, 7], b \in [-26, -14], c \in [21, 26]$, and $r \in [-257, -246]$.

C. $a \in [17, 22], b \in [-103, -96], c \in [424, 427]$, and $r \in [-2255, -2252]$.

D. $a \in [17, 22], b \in [96, 105], c \in [424, 427]$, and $r \in [1992, 1999]$.

E. $a \in [2, 7], b \in [17, 23], c \in [21, 26]$, and $r \in [-7, -3]$.

---

5. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{20x^3 + 55x^2 - 30x - 43}{x + 3}$$

A. $a \in [-62, -56]$, $b \in [-130, -124]$, $c \in [-406, -400]$, and $r \in [-1263, -1256]$.

B. $a \in [19, 26]$, $b \in [111, 121]$, $c \in [310, 319]$, and $r \in [898, 908]$.

C. $a \in [-62, -56]$, $b \in [231, 237]$, $c \in [-735, -733]$, and $r \in [2160, 2164]$.

D. $a \in [19, 26]$, $b \in [-26, -22]$, $c \in [66, 73]$, and $r \in [-327, -319]$.

E. $a \in [19, 26]$, $b \in [-6, -1]$, $c \in [-18, -14]$, and $r \in [1, 8]$.

---

6. Factor the polynomial below completely, knowing that $x - 5$ is a factor. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3 \leq z_4$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 10x^4 - 113x^3 + 434x^2 - 655x + 300$$

A. $z_1 \in [-1.5, 0.7]$, $z_2 \in [0.88, 2.15]$, $z_3 \in [2.83, 3.07]$, and $z_4 \in [4.76, 5.22]$

B. $z_1 \in [-6.1, -4.5]$, $z_2 \in [-3.06, -1.3]$, $z_3 \in [-1.58, -0.95]$, and $z_4 \in [-0.43, -0.37]$

C. $z_1 \in [0.5, 0.9]$, $z_2 \in [2.3, 2.76]$, $z_3 \in [2.83, 3.07]$, and $z_4 \in [4.76, 5.22]$

D. $z_1 \in [-6.1, -4.5]$, $z_2 \in [-3.06, -1.3]$, $z_3 \in [-2.56, -2.44]$, and $z_4 \in [-0.91, -0.66]$

E. $z_1 \in [-6.1, -4.5]$, $z_2 \in [-4.78, -3.6]$, $z_3 \in [-3.23, -2.63]$, and $z_4 \in [-0.61, -0.48]$

---

7. Factor the polynomial below completely, knowing that $x-2$ is a factor. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3 \leq z_4$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 12x^4 - 83x^3 + 197x^2 - 188x + 60$$

A. $z_1 \in [-3.21, -2.92]$, $z_2 \in [-2.11, -1.9]$, $z_3 \in [-1.87, -1.4]$, and $z_4 \in [-0.97, -0.76]$

B. $z_1 \in [-3.21, -2.92]$, $z_2 \in [-2.11, -1.9]$, $z_3 \in [-2.06, -1.61]$, and $z_4 \in [-0.48, -0.26]$

C. $z_1 \in [0.79, 1.04]$, $z_2 \in [1.45, 1.69]$, $z_3 \in [1.79, 2.39]$, and $z_4 \in [2.98, 3.13]$

D. $z_1 \in [-3.21, -2.92]$, $z_2 \in [-2.11, -1.9]$, $z_3 \in [-1.42, -1.16]$, and $z_4 \in [-0.73, -0.63]$

E. $z_1 \in [0.42, 0.78]$, $z_2 \in [0.65, 1.49]$, $z_3 \in [1.79, 2.39]$, and $z_4 \in [2.98, 3.13]$

---

8. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{10x^3 - 46x^2 + 40x + 22}{x - 3}$$

A. $a \in [29, 35]$, $b \in [41, 48]$, $c \in [169, 174]$, and $r \in [534, 540]$.

B. $a \in [10, 11]$, $b \in [-18, -9]$, $c \in [-8, -7]$, and $r \in [-5, 2]$.

C. $a \in [10, 11]$, $b \in [-76, -75]$, $c \in [265, 271]$, and $r \in [-787, -778]$.

D. $a \in [29, 35]$, $b \in [-137, -132]$, $c \in [448, 452]$, and $r \in [-1326, -1315]$.

E. $a \in [10, 11]$, $b \in [-30, -22]$, $c \in [-12, -9]$, and $r \in [-5, 2]$.

---

9. What are the *possible Integer* roots of the polynomial below?

$$f(x) = 6x^2 + 7x + 7$$

A. $\pm 1, \pm 2, \pm 3, \pm 6$

B. $\pm 1, \pm 7$

C. All combinations of: $\dfrac{\pm 1, \pm 2, \pm 3, \pm 6}{\pm 1, \pm 7}$

D. All combinations of: $\dfrac{\pm 1, \pm 7}{\pm 1, \pm 2, \pm 3, \pm 6}$

E. There is no formula or theorem that tells us all possible Integer roots.

---

10. What are the *possible Integer* roots of the polynomial below?

$$f(x) = 6x^2 + 6x + 4$$

A. $\pm 1, \pm 2, \pm 4$

B. $\pm 1, \pm 2, \pm 3, \pm 6$

C. All combinations of: $\dfrac{\pm 1, \pm 2, \pm 3, \pm 6}{\pm 1, \pm 2, \pm 4}$

D. All combinations of: $\dfrac{\pm 1, \pm 2, \pm 4}{\pm 1, \pm 2, \pm 3, \pm 6}$

E. There is no formula or theorem that tells us all possible Integer roots.

---

11. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{20x^3 + 105x^2 - 128}{x + 5}$$

A. $a \in [19, 27], b \in [-15, -11], c \in [89, 92]$, and $r \in [-670, -662]$.

B. $a \in [19, 27], b \in [2, 11], c \in [-30, -24]$, and $r \in [-7, -2]$.

C. $a \in [-105, -94], b \in [-397, -394], c \in [-1976, -1973]$, and $r \in [-10008, -9998]$.

D. $a \in [-105, -94], b \in [602, 607], c \in [-3027, -3024]$, and $r \in [14989, 15000]$.

E. $a \in [19, 27], b \in [203, 206], c \in [1023, 1026]$, and $r \in [4997, 5002]$.

---

12. Factor the polynomial below completely. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 10x^3 - 39x^2 - 61x + 30$$

A. $z_1 \in [-2.4, -0.9]$, $z_2 \in [0.36, 0.97]$, and $z_3 \in [4.87, 5.67]$

B. $z_1 \in [-5.1, -4.1]$, $z_2 \in [-0.78, -0.09]$, and $z_3 \in [0.97, 1.69]$

C. $z_1 \in [-1.4, 0.1]$, $z_2 \in [2.08, 3.12]$, and $z_3 \in [4.87, 5.67]$

D. $z_1 \in [-5.1, -4.1]$, $z_2 \in [-3.19, -2.32]$, and $z_3 \in [0.45, 0.75]$

E. $z_1 \in [-5.1, -4.1]$, $z_2 \in [-2.36, -1.87]$, and $z_3 \in [0.14, 0.36]$

---

13. Factor the polynomial below completely. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 15x^3 - 1x^2 - 52x + 20$$

A. $z_1 \in [-1.85, -1.24]$, $z_2 \in [-0.43, -0.35]$, and $z_3 \in [1.81, 2.03]$

B. $z_1 \in [-2.78, -2.35]$, $z_2 \in [-0.6, -0.46]$, and $z_3 \in [1.81, 2.03]$

C. $z_1 \in [-5.02, -4.61]$, $z_2 \in [-0.17, -0.02]$, and $z_3 \in [1.81, 2.03]$

D. $z_1 \in [-2.33, -1.98]$, $z_2 \in [0.59, 0.64]$, and $z_3 \in [2.15, 2.76]$

E. $z_1 \in [-2.33, -1.98]$, $z_2 \in [0.38, 0.48]$, and $z_3 \in [1.36, 1.85]$

---

14. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{8x^3 - 62x + 33}{x + 3}$$

A. $a \in [4, 9], b \in [-39, -31], c \in [62, 69],$ and $r \in [-232, -225]$.

B. $a \in [-27, -21], b \in [-72, -67], c \in [-280, -277],$ and $r \in [-804, -800]$.

C. $a \in [4, 9], b \in [20, 26], c \in [7, 15],$ and $r \in [58, 66]$.

D. $a \in [-27, -21], b \in [71, 77], c \in [-280, -277],$ and $r \in [867, 868]$.

E. $a \in [4, 9], b \in [-28, -21], c \in [7, 15],$ and $r \in [2, 5]$.

---

15. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{4x^3 - 22x^2 + 4x + 26}{x - 5}$$

A. $a \in [2, 5], \ b \in [-2, 2], \ c \in [-6, -5],$ and $r \in [-7, -1]$.

B. $a \in [20, 23], \ b \in [75, 79], \ c \in [394, 399],$ and $r \in [1991, 1997]$.

C. $a \in [2, 5], \ b \in [-8, -5], \ c \in [-24, -18],$ and $r \in [-58, -52]$.

D. $a \in [2, 5], \ b \in [-43, -39], \ c \in [213, 221],$ and $r \in [-1044, -1043]$.

E. $a \in [20, 23], \ b \in [-125, -115], \ c \in [610, 618],$ and $r \in [-3050, -3036]$.

---

16. Factor the polynomial below completely, knowing that $x + 3$ is a factor. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3 \leq z_4$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 4x^4 + 4x^3 - 51x^2 - 36x + 135$$

A. $z_1 \in [-5, 1], \ z_2 \in [-2.54, -2.45], z_3 \in [1.24, 1.53],$ and $z_4 \in [3, 4]$

B. $z_1 \in [-5, 1], \ z_2 \in [-0.8, -0.68], z_3 \in [2.74, 3.16],$ and $z_4 \in [5, 7]$

C. $z_1 \in [-5, 1], \ z_2 \in [-0.72, -0.56], z_3 \in [0.32, 0.59],$ and $z_4 \in [3, 4]$

D. $z_1 \in [-5, 1]$, $z_2 \in [-0.5, -0.35], z_3 \in [0.42, 0.9]$, and $z_4 \in [3, 4]$

E. $z_1 \in [-5, 1]$, $z_2 \in [-1.5, -1.46], z_3 \in [2.24, 2.69]$, and $z_4 \in [3, 4]$

---

17. Factor the polynomial below completely, knowing that $x + 4$ is a factor. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3 \leq z_4$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 12x^4 + 101x^3 + 165x^2 - 248x - 240$$

A. $z_1 \in [-0.46, 0.02]$, $z_2 \in [2.74, 3.09], z_3 \in [3.87, 4.03]$, and $z_4 \in [3.99, 5.65]$

B. $z_1 \in [-5.22, -4.73]$, $z_2 \in [-4.54, -3.29], z_3 \in [-2.25, -0.9]$, and $z_4 \in [-0.17, 1]$

C. $z_1 \in [-1.56, -0.95]$, $z_2 \in [0.63, 0.84], z_3 \in [3.87, 4.03]$, and $z_4 \in [3.99, 5.65]$

D. $z_1 \in [-0.96, -0.61]$, $z_2 \in [1.26, 1.46], z_3 \in [3.87, 4.03]$, and $z_4 \in [3.99, 5.65]$

E. $z_1 \in [-5.22, -4.73]$, $z_2 \in [-4.54, -3.29], z_3 \in [-1, -0.5]$, and $z_4 \in [0.79, 1.62]$

---

18. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{25x^3 - 85x^2 + 15x + 40}{x - 3}$$

A. $a \in [73, 76]$, $b \in [-314, -306]$, $c \in [945, 951]$, and $r \in [-2795, -2791]$.

B. $a \in [25, 26]$, $b \in [-163, -157]$, $c \in [492, 496]$, and $r \in [-1445, -1441]$.

C. $a \in [73, 76]$, $b \in [136, 145]$, $c \in [432, 438]$, and $r \in [1340, 1346]$.

D. $a \in [25, 26]$, $b \in [-42, -31]$, $c \in [-60, -51]$, and $r \in [-71, -65]$.

E. $a \in [25, 26]$, $b \in [-19, -9]$, $c \in [-17, -12]$, and $r \in [-5, -1]$.

---

19. What are the *possible Integer* roots of the polynomial below?

$$f(x) = 3x^2 + 5x + 4$$

A. $\pm 1, \pm 2, \pm 4$

B. All combinations of: $\dfrac{\pm 1, \pm 3}{\pm 1, \pm 2, \pm 4}$

C. All combinations of: $\dfrac{\pm 1, \pm 2, \pm 4}{\pm 1, \pm 3}$

D. $\pm 1, \pm 3$

E. There is no formula or theorem that tells us all possible Integer roots.

---

20. What are the *possible Integer* roots of the polynomial below?

$$f(x) = 5x^2 + 5x + 2$$

A. All combinations of: $\dfrac{\pm 1, \pm 5}{\pm 1, \pm 2}$

B. $\pm 1, \pm 2$

C. $\pm 1, \pm 5$

D. All combinations of: $\dfrac{\pm 1, \pm 2}{\pm 1, \pm 5}$

E. There is no formula or theorem that tells us all possible Integer roots.

---

21. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{16x^3 - 49x + 32}{x + 2}$$

A. $a \in [16, 18], b \in [31, 38], c \in [12, 17],$ and $r \in [59, 67]$.

B. $a \in [-34, -25], b \in [-69, -63], c \in [-182, -175],$ and $r \in [-324, -318]$.

C. $a \in [-34, -25], b \in [57, 67], c \in [-182, -175],$ and $r \in [385, 392]$.

D. $a \in [16, 18], b \in [-49, -47], c \in [91, 99]$, and $r \in [-253, -246]$.

E. $a \in [16, 18], b \in [-40, -28], c \in [12, 17]$, and $r \in [-1, 5]$.

---

22. Factor the polynomial below completely. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 6x^3 - 35x^2 + 66x - 40$$

A. $z_1 \in [-2.69, -2.1]$, $z_2 \in [-3, -1.8]$, and $z_3 \in [-1.45, -1.14]$

B. $z_1 \in [-5.19, -4.42]$, $z_2 \in [-3, -1.8]$, and $z_3 \in [-0.8, -0.42]$

C. $z_1 \in [1.1, 1.67]$, $z_2 \in [1, 2.5]$, and $z_3 \in [2.32, 2.71]$

D. $z_1 \in [-2.18, -1.47]$, $z_2 \in [-1.1, -0.6]$, and $z_3 \in [-0.62, -0.23]$

E. $z_1 \in [0.05, 0.53]$, $z_2 \in [0.4, 1.5]$, and $z_3 \in [1.95, 2.11]$

---

23. Factor the polynomial below completely. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 25x^3 - 45x^2 - 82x - 24$$

A. $z_1 \in [-3.11, -2.79]$, $z_2 \in [0.24, 0.6]$, and $z_3 \in [0.38, 0.88]$

B. $z_1 \in [-3.11, -2.79]$, $z_2 \in [1.07, 1.31]$, and $z_3 \in [2.14, 2.54]$

C. $z_1 \in [-1.16, -0.39]$, $z_2 \in [-0.67, -0.28]$, and $z_3 \in [2.54, 3.27]$

D. $z_1 \in [-2.65, -2.14]$, $z_2 \in [-1.42, -1.09]$, and $z_3 \in [2.54, 3.27]$

E. $z_1 \in [-3.11, -2.79]$, $z_2 \in [0.09, 0.19]$, and $z_3 \in [1.46, 2.4]$

---

24. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{10x^3 - 35x^2 + 42}{x - 3}$$

A. $a \in [28, 31], b \in [54, 58], c \in [160, 169]$, and $r \in [535, 539]$.

B. $a \in [28, 31], b \in [-126, -122], c \in [369, 376]$, and $r \in [-1084, -1081]$.

C. $a \in [5, 15], b \in [-6, -2], c \in [-20, -6]$, and $r \in [-5, 1]$.

D. $a \in [5, 15], b \in [-17, -7], c \in [-34, -25]$, and $r \in [-20, -12]$.

E. $a \in [5, 15], b \in [-65, -61], c \in [193, 197]$, and $r \in [-545, -541]$.

---

25. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{12x^3 - 34x^2 - 10x + 7}{x - 3}$$

A. $a \in [31, 39]$, $b \in [71, 77]$, $c \in [211, 218]$, and $r \in [643, 650]$.

B. $a \in [10, 17]$, $b \in [-11, -8]$, $c \in [-30, -25]$, and $r \in [-58, -51]$.

C. $a \in [10, 17]$, $b \in [-2, 3]$, $c \in [-5, -2]$, and $r \in [-6, 0]$.

D. $a \in [10, 17]$, $b \in [-75, -64]$, $c \in [194, 203]$, and $r \in [-596, -584]$.

E. $a \in [31, 39]$, $b \in [-148, -138]$, $c \in [415, 418]$, and $r \in [-1243, -1237]$.

---

26. Factor the polynomial below completely, knowing that $x + 3$ is a factor. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3 \leq z_4$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 8x^4 + 26x^3 - 37x^2 - 159x - 90$$

A. $z_1 \in [-1.23, -0.19]$, $z_2 \in [0.77, 1.43], z_3 \in [1.38, 2.29]$, and $z_4 \in [2.6, 4.3]$

B. $z_1 \in [-5.3, -4.32]$, $z_2 \in [0.15, 0.47], z_3 \in [1.38, 2.29]$, and $z_4 \in [2.6, 4.3]$

C. $z_1 \in [-3.63, -2.76]$, $z_2 \in [-2.18, -1.85], z_3 \in [-0.83, -0.16]$, and $z_4 \in [0.6, 2.9]$

D. $z_1 \in [-3.63, -2.76]$, $z_2 \in [-2.18, -1.85], z_3 \in [-1.36, -0.79]$, and $z_4 \in [-0.4, 1.4]$

E. $z_1 \in [-2.68, -2.27]$, $z_2 \in [0.61, 0.85], z_3 \in [1.38, 2.29]$, and $z_4 \in [2.6, 4.3]$

---

27. Factor the polynomial below completely, knowing that $x+2$ is a factor. Then, choose the intervals the zeros of the polynomial belong to, where $z_1 \leq z_2 \leq z_3 \leq z_4$. *To make the problem easier, all zeros are between -5 and 5.*

$$f(x) = 12x^4 - 29x^3 - 33x^2 + 116x - 60$$

A. $z_1 \in [-2.5, -1.9]$, $z_2 \in [-1.75, -1.65], z_3 \in [-0.91, -0.74]$, and $z_4 \in [1, 5]$

B. $z_1 \in [-2.5, -1.9]$, $z_2 \in [0.67, 0.79], z_3 \in [1.58, 1.81]$, and $z_4 \in [1, 5]$

C. $z_1 \in [-2.5, -1.9]$, $z_2 \in [0.58, 0.66], z_3 \in [1.23, 1.34]$, and $z_4 \in [1, 5]$

D. $z_1 \in [-2.5, -1.9]$, $z_2 \in [-1.42, -1.31], z_3 \in [-0.72, -0.45]$, and $z_4 \in [1, 5]$

E. $z_1 \in [-3.2, -2.7]$, $z_2 \in [-2.01, -1.99], z_3 \in [-0.58, -0.21]$, and $z_4 \in [1, 5]$

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28. Perform the division below. Then, find the intervals that correspond to the quotient in the form $ax^2 + bx + c$ and remainder r.

$$\frac{20x^3 - 45x^2 - 15x + 45}{x - 2}$$

A. $a \in [18, 23]$, $b \in [-8, -2]$, $c \in [-30, -22]$, and $r \in [-5, -2]$.

B. $a \in [40, 42]$, $b \in [-130, -123]$, $c \in [233, 239]$, and $r \in [-425, -423]$.

C. $a \in [18, 23]$, $b \in [-87, -83]$, $c \in [152, 156]$, and $r \in [-269, -264]$.

D. $a \in [18, 23]$, $b \in [-27, -22]$, $c \in [-40, -39]$, and $r \in [5, 10]$.

E. $a \in [40, 42]$, $b \in [31, 36]$, $c \in [52, 57]$, and $r \in [155, 161]$.

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29. What are the *possible Rational* roots of the polynomial below?

$$f(x) = 6x^3 + 2x^2 + 2x + 2$$

A. $\pm 1, \pm 2$

B. $\pm 1, \pm 2, \pm 3, \pm 6$

C. All combinations of: $\dfrac{\pm 1, \pm 2}{\pm 1, \pm 2, \pm 3, \pm 6}$

D. All combinations of: $\dfrac{\pm 1, \pm 2, \pm 3, \pm 6}{\pm 1, \pm 2}$

E. There is no formula or theorem that tells us all possible Rational roots.

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30. What are the *possible Integer* roots of the polynomial below?

$$f(x) = 3x^4 + 2x^3 + 6x^2 + 7x + 7$$

A. All combinations of: $\dfrac{\pm 1, \pm 3}{\pm 1, \pm 7}$

B. All combinations of: $\dfrac{\pm 1, \pm 7}{\pm 1, \pm 3}$

C. $\pm 1, \pm 7$

D. $\pm 1, \pm 3$

E. There is no formula or theorem that tells us all possible Integer roots.
